

**INORGANIC PHOSPHATE CEMENT COMPOSITIONS
FOR SOLID FREEFORM FABRICATION**

5

ABSTRACT OF THE DISCLOSURE

The present invention is drawn toward materials, methods and systems for solid free-form fabrication of three dimensional objects. In one embodiment, a method for solid free-form fabrication of a three-dimensional object can 10 comprise steps of a) depositing a particulate composition including inorganic phosphate particulates in a defined region; b) ink-jetting an aqueous liquid onto a predetermined area of the particulate composition to form hydrated cement in the predetermined area; c) hardening the hydrated cement; and repeating steps a) through c) such that multiple layers of the cement are formed that are bound 15 to one another, thereby forming the three dimensional object. In another embodiment, a system for solid free-form fabrication of three-dimensional objects can comprise a particulate composition including inorganic phosphate particulates; a substrate configured for supporting at least a layer of the particulate composition in a defined region; and an ink-jettable aqueous liquid 20 configured for being jetted in the defined region to hydrate at least a portion of the particulate composition to form a cement.